

# FLIGHT

The  
AIRCRAFT  
ENGINEER  
&  
AIRSHIPS

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport

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## Flight

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### DIARY OF FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in the following list:

- Mar. 15 .... Entries close for Dutch Height Indicator Competition.
- Mar. 15 .... Lecture, "The Control of Aeroplanes at S'ow Speeds," by Professor B. Melvill Jones, b. fore R.Ae.S.
- Mar. 23 .... Entries close for Gordon Bennett Balloon Race
- Apl. 12 .... Lecture, "Some Controversial Points in Aircraft Design," by F. T. Hill, before I.Ae.E.
- May 11 .... Lecture, "Experimental Flying," by Maj. M. E. A. Wright, before I.Ae.E.
- June 25-30 International Air Congress, London
- June 30 .... R.A.F. Aerial Pageant
- July .... Air Race for King's Cup
- July 20 .... Gothenburg Exhibition
- Aug. 6 .... Aerial Derby
- Aug. 6-27 French Gliding Competition, near Cherbourg
- Aug. 8-12 F.I.A. Conference, Gothenburg.
- Sept. 23 Gordon Bennett Balloon Race, Belgium
- Sept. 28 Schneider Cup Seaplane Race at Cowes
- Dec. 1 .... Entries close for French Aero Engine Competition

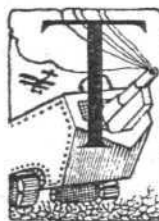
1924

- Mar. 1 .... French Aero Engine Competition.

### INDEX FOR VOL. XIV.

The Index for Vol. XIV of FLIGHT (January to December, 1922) is now ready, and can be obtained from the Publishers, 36, Great Queen Street, Kingsway, W.C. 2. Price 1s. per copy (1s. 1d. post free).

### EDITORIAL COMMENT.



#### The Air Estimates

THE Air Estimates for 1923-1924, a summary of which is published elsewhere in this issue, call for an expenditure of a little over 12 million sterling. This corresponds to an increase over the present financial year of £1,116,000, and although—compared with the £58,000,000 asked for by the Navy—this amount is certainly very modest (the relative values to the nation of the Navy and the R.A.F. being in a very different ratio from that indicated by the Estimates), there is a great deal of satisfaction in noting that out of this total of 12 million odd something over three million is to be spent upon the purchase of aeroplanes, seaplanes, engines and spares.

We have repeatedly pointed out in these columns the vital necessity of providing the R.A.F. with fresh equipment, calling attention to the false economy resulting from the continued use of "re-conditioned" war-type of machines. Were it not for the fact that the nation is as much as ever in need of retrenchment, we should say that the paltry 12 million asked for was totally inadequate. As it is, we must be content to make haste slowly, and to seek consolation in the fact that things are at any rate moving in the right direction, money being saved on the Army and Navy, and some of that saved being expended on the R.A.F. That being so, we think it can be said that the turning-point has been reached, and that after existing mainly on hope and faith for five years or so, the aircraft industry is at last about to be given, to some small extent, the financial support it deserves.

That support is small enough, in all conscience, but it should, at any rate, serve to keep existing designing and construction firms in operation for

another year, although they will certainly not grow rich on the orders about to be placed. Let us assume, for the sake of argument, that there are 20 aircraft firms actively engaged upon aeroplane and seaplane design. £1,913,400 is to be spent upon new complete machines, and a further £395,400 on machine spares, etc. This gives a total of £1,308,800 to be distributed in orders to the aircraft industry. Assuming that the orders are quite evenly distributed (this will not, of course, be the case, nor would it necessarily be desirable), it will mean that each of the 20 firms which we assumed to exist will receive orders to the extent of £65,440 during the next financial year. If we take the average price of aeroplanes and seaplanes (without engines) as being £6,000, we arrive at an average of orders of 11 machines per firm, or something over 200 machines all told.

Actually that number would be reduced on account of a certain proportion of the money being spent on spares and equipment; but, on the other hand, certain types of machines would be ordered in quantities which would tend to reduce the average cost per machine. Probably the estimate, rough as it is, will not be very far wrong, and it is doubtful if more than 200 machines will be ordered. Of these some will be experimental types—and, therefore, relatively expensive—while certain others will be standardised and issued to the squadrons, some of them to the seven new squadrons for home defence, and some to the three new squadrons which are to be added to the air units working with the Navy. Assuming the average strength of a squadron to be 12 machines, the 10 new squadrons alone would account for 120 out of the 200 machines, leaving little enough for other purposes. Thus, much as we desire to see the most rigid economy practised, it cannot, we think, be said by anyone at all conversant with air matters that the section of Vote 3 which deals with aeroplanes and seaplanes is at all extravagant. Rather do we consider it extremely moderate.

In the case of aero engines the position is much the same, but is improved somewhat by the fact that, once an aero engine has been developed, it is suitable for a variety of types of aircraft. On the other hand, it costs very much more to develop a new type of engine than it does to produce a new type of aircraft, but it is assumed that the sums estimated for complete engines and spares do not include the cost of research on entirely new type, which is often carried out on single-cylinder units, and, therefore, scarcely to be regarded as complete engines. The cost of any such experiments will presumably be borne on the research vote.

Owing to the re-arrangement of votes which has taken place, it is somewhat difficult to follow at all closely the manner in which money is to be expended on research. The Royal Aircraft Establishment at Farnborough shows a formidable list of personnel, with a wages estimate of £283,200, and a total estimate of £380,500, which, however, is reduced to £35,500 by deducting "Cash expenditure on production and experimental work," for which provision is made under sub-heads A, D, E, F and G of Vote 3. Reference to these sub-heads indicates that the Royal Aircraft Establishment is being paid for aeroplanes, seaplanes, engines and spares (sub-head A), instruments and photographic equipment (D), armament and ammunition (E), wireless and electrical

equipment (F), and miscellaneous research (G), out of the sums allotted for these various sub-heads. A detailed statement of how much from each is not given. The status of research is further obscured by the fact that the directorate of research is at present being re-organised, no itemised statement being possible. Large sections of this department, which were formerly at the Air Ministry, have, it is known, been transferred to Farnborough, "for reasons of economy," it has been stated.

It is gratifying to find at any rate one plain statement relating to research—under sub-head G of Vote 3, i.e., Miscellaneous Research. This sets aside £159,500 for metal construction, accessories, etc. It may be assumed, and we hope, that out of that amount a large percentage will be devoted to metal construction. Even if the whole amount is expended upon this subject, it will be none too much, as the development of economical forms of metal construction is a costly business. It is, however, one which will have to be tackled sooner or later, and it seems probable that, as no definite distinction is made in this year's Estimates between experimental and production types of machines, a certain number of metal machines will be paid for out of the item for complete machines, leaving a fair proportion for research work on forms of metal construction.

Another subject on which research must be continued is that of control at large angles. It is now becoming increasingly evident that the solution to the speed range problem does not lie in the choice of wing section, as was thought at one time, so much as in having effective controls. Up to the present we have been in the habit of saying: Wing loading so much, lift coefficient so much, landing speed so much. The region beyond the angle of maximum lift, or stalling angle, has until the last year or so received somewhat scant attention, yet it now seems probable that this region may easily prove at least as important, since it gives fair promise of allowing reasonably high wing loadings while enabling a machine to come into a landing ground at a very steep angle as regards its path, but with the fuselage nearly horizontal. In this way we may actually attain landing speeds so low that to reach them by ordinary means would mean a wing loading so light as to detract seriously from the commercial possibilities of the machine. Research on this subject is now being carried out, not only at the R.A.E., we are glad to say, but also, and at least as successfully, by private enterprise. But such experiments require considerable expenditure, and it is to be hoped that out of this year's Estimates a goodly proportion will be devoted to this subject, which is, perhaps, the most important in aviation today.

Practically the only new item on the Air Estimates is that of £238,000 for Vote 7, Auxiliary and Reserve Forces. Of the two the Reserve calls for £238,000, while the Auxiliary Air Force appears to be somewhat far away with grants to county associations of £1,000 only. In view of its great importance to the R.A.F., the relatively small amount to be spent on the Reserve will scarcely be grudged by anyone, and if the single items of the Vote are examined each is found to be very modest indeed. The largest item occurs under sub-head C, Reserve Pay. This amounts to £4,000 for retaining fees for officers and £140,000 reserve pay of non-commissioned officers, pilots and airmen.

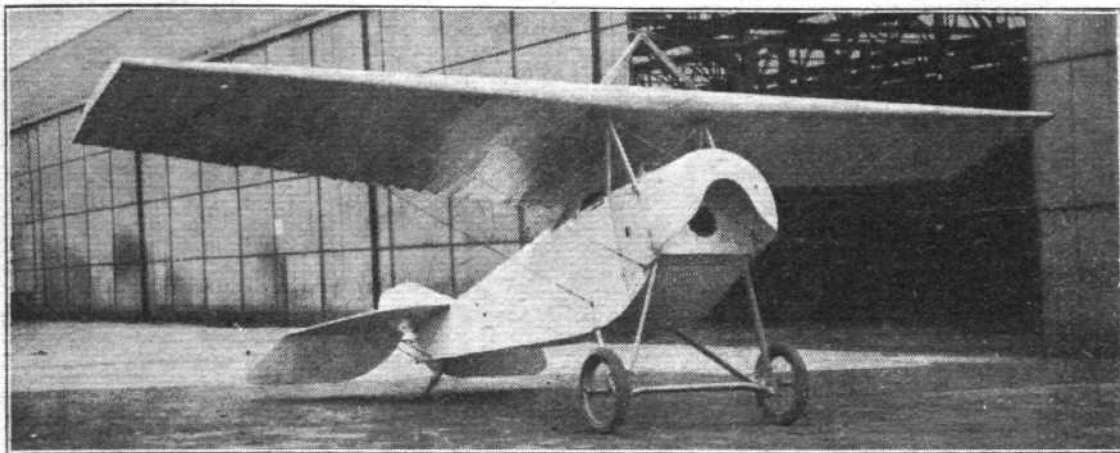


# A VARIABLE CAMBER MONOPLANE

## An Interesting Aircraft Disposal Co. Experiment

It is now fairly generally agreed that no great progress is to be expected in the design of fixed-section aeroplane wings. Small improvements may result from further experiment, but if any marked gain in efficiency is to be attained it is admitted that we shall have to look to wings of other than fixed section and fixed area. An increase in lift can, of course, be obtained

angles. There are those who maintain, however, that the sharp break in a wing section which occurs with a hinged trailing edge cannot be as efficient as a wing in which the curves of the section are as smooth at maximum camber as they are when the wing is flattened out. While that is probably true, the mechanical difficulties are considerably



Three-quarter front view of variable camber monoplane.

in many ways. One method is by increasing the wing area for slow speed, decreasing it for high speed. The structural difficulties are very great. Then there is the slotted wing invented by Handley Page, in which the "burble point" is made to occur much later, *i.e.*, at a higher angle of incidence, and consequently a greater lift is obtained. Extraordinarily

greater than those involved in the hinged-trailing-edge type of wing, and although several examples of variable camber wings have been produced, no really satisfactory wing of this type has yet been evolved.

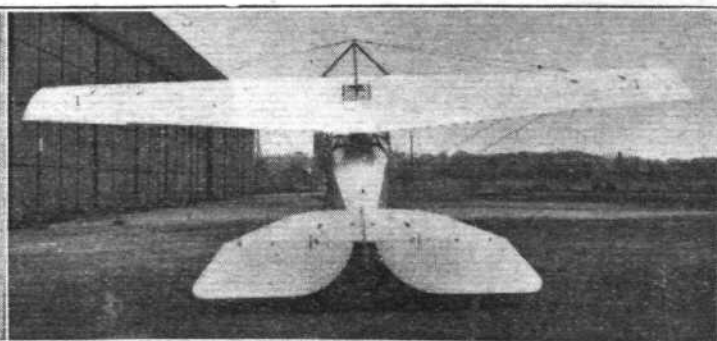
The Aircraft Disposal Co. have recently secured a design in which the camber is varied smoothly by means of flexible wing

Three-quarter rear view of variable camber monoplane.



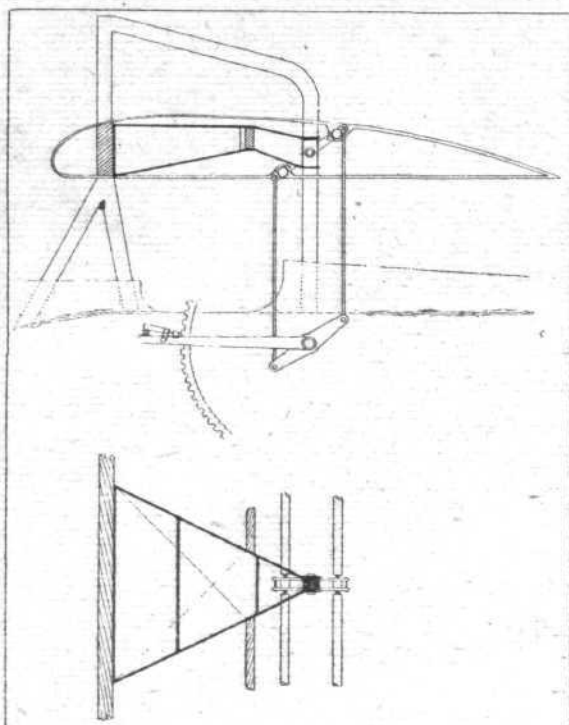
great increases in the lift have been obtained in this way. An alteration in camber is known greatly to affect the lift, and by the use of a hinged trailing edge, as in the Fairey machines, the wing camber is virtually altered, the lift varying with the camber. This system also has given excellent results, not only in lift variation but in control at large

ribs. An experimental machine incorporating this feature arrived at the Waddon factory some weeks ago, and we understand that flying tests will be carried out shortly. The machine is stated to have been flown by the original makers, but the A.D.C. desire to carry out thorough tests of their own before finally deciding on the merits of the design. In the



Front and rear views of variable camber monoplane.

description which follows it should be borne in mind that the machine is purely experimental, and that it contains features which would not be perpetuated in later types, should the Aircraft Disposal Co. decide to take it up.

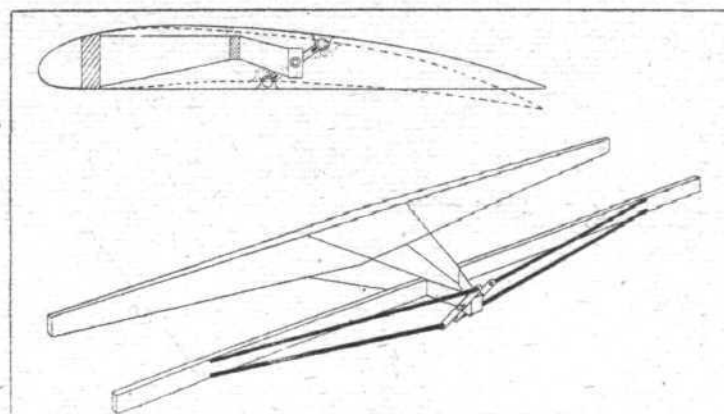


Section and plan of the spar supports, operating cranks etc., of the variable camber wing.

Fundamentally, the variable camber monoplane consists of the fuselage of a French Nieuport "one-and-a-half" plane of the type popular during the War, supported by a thick tapering parasol wing. It was probably chosen because it happened to be of about the right size, and was available at

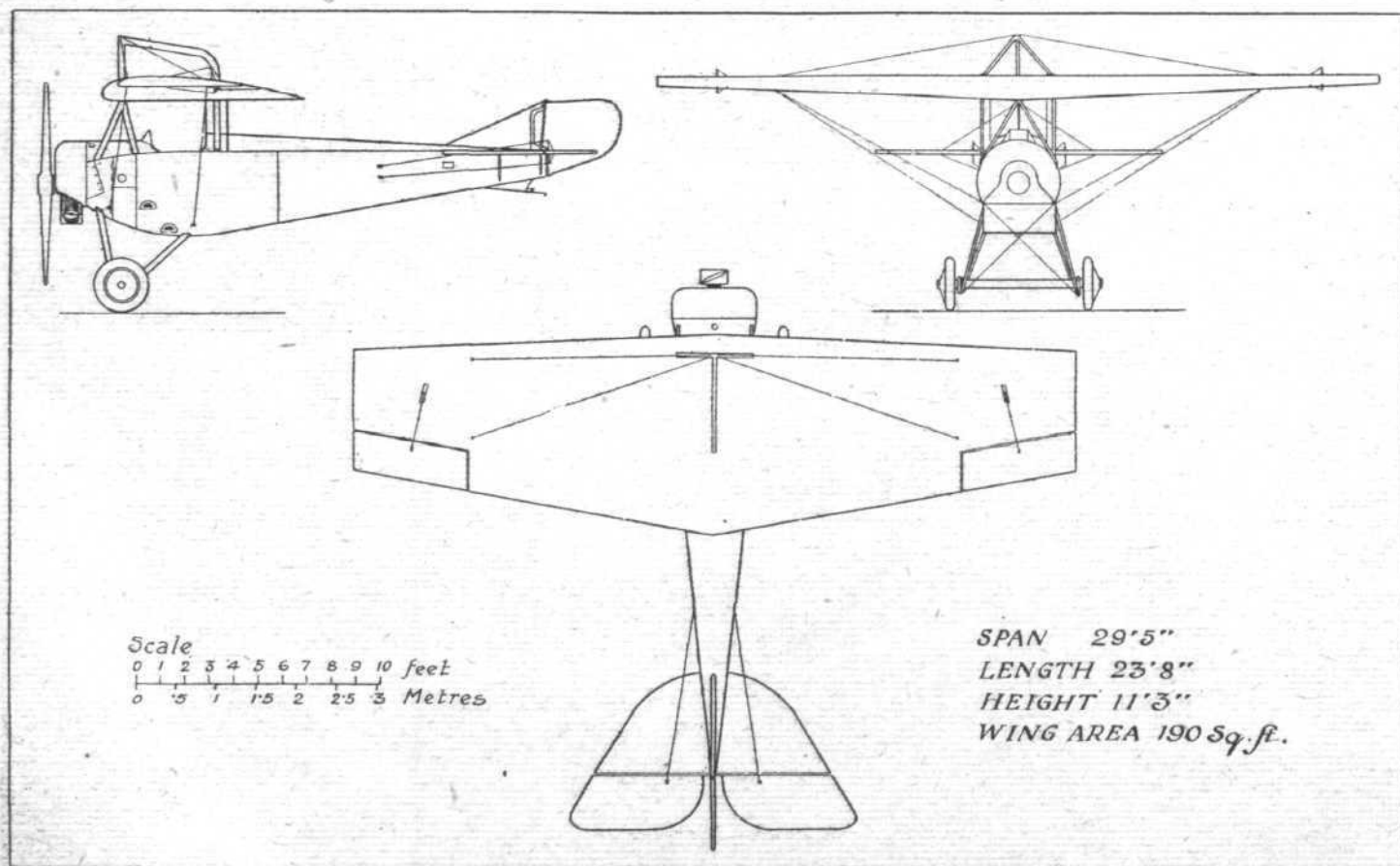
the time the inventor of the wing wished to make full-size flying tests. Thus it is not to be regarded as a permanent portion of the design, but merely as a sort of full-scale "laboratory" for the testing of the wing. That being the case, and the Nieuport having been described in detail in FLIGHT during the War, there is little need to refer to the details of it. The same applies to the under-carriage, and to a certain extent to the tail, the only departure appearing to be a slight increase in the size of the latter.

The wing is of interest owing to the principle employed of securing the ribs to the front spar only (which is very deep), the function of the rear spar being mainly to form a member of the internal drag bracing.



Diagrammatic perspective view of the camber-operating tubes, spars, etc., of the variable camber wing. The upper diagram shows the manner in which the camber and section are altered. For high speed the section is thick and flat, for slow speed it is thin and deeply cambered.

The trailing portion of the ribs is supported on two tubes, hinged at their outer ends to a stout box rib, and at their inner ends to a rocking crank. This crank is operated by pull and push rods springing from cranks inside the fuselage. The upper rib flanges are secured to one of these tubes and the



General arrangement drawings of the variable camber monoplane with which the Aircraft Disposal Co. is now experimenting.



lower flanges to the other. The rib to which the outer ends of the camber tubes are hinged occurs in line with the inner end of the ailerons, and as the tubes take their fulcrum at this point it will be seen that the outer portion of the wing does not have its camber altered, while the central portion has its camber progressively changed as the centre-line is approached. Thus the inner portion of the wing, where the chord is greatest, receives a maximum of change, while the tips remain unaffected. While this may to a certain extent reduce the effectiveness of the camber gear, it facilitates construction, and with the tapered wing the central portion, which includes the maximum area, is mostly affected.

The wing is mounted above the fuselage on struts, and it will be seen that, whereas there are struts directly supporting the front spar, the rear spar is supported indirectly by a channel-section steel member of triangular plan form, against the sides of which the roots of the rear spar abut. The accompanying diagrams should make the principle clear, and as it is highly probable that the details will be altered in later machines, we have not thought it of any interest to publish sketches of the particular manner of giving effect to the fundamental principle.

The wing construction appears to be open to criticism on

account of the method which has been adopted of stitching the top fabric to the top flange only, and not through to the lower flange. This was, however, necessary in order to enable the wing to change its thickness simultaneously with the change in camber. The effect of the camber gear is to change the section in the centre from a flat-bottom camber, thick-section, to a thinner, deeply cambered section. As this is what is required (thick wings with flat or convex bottom camber having a low lift and a high value of  $L/D$ , while thin deeply-cambered wings have a high lift coefficient but a relatively inferior  $L/D$ ), it may be expected that the wing will give extra speed range, although to how great extent yet remains to be seen.

In the meantime, the machine, as already stated, is being overhauled at Waddon, and Major Grant is having it strengthened up wherever it seems to him to require it. The machine arrived without engine, and an engine from the large stocks of the A.D.C. is being put in, probably a Clerget or le Rhône. It will be interesting to learn the results of actual flying tests, and should these be promising it is easy enough to visualise detail improvements upon what is, after all, but a relatively crude experimental wing, built as cheaply as possible in order to test an idea.



#### The Czech Society of Great Britain and Sir Charles Wakefield

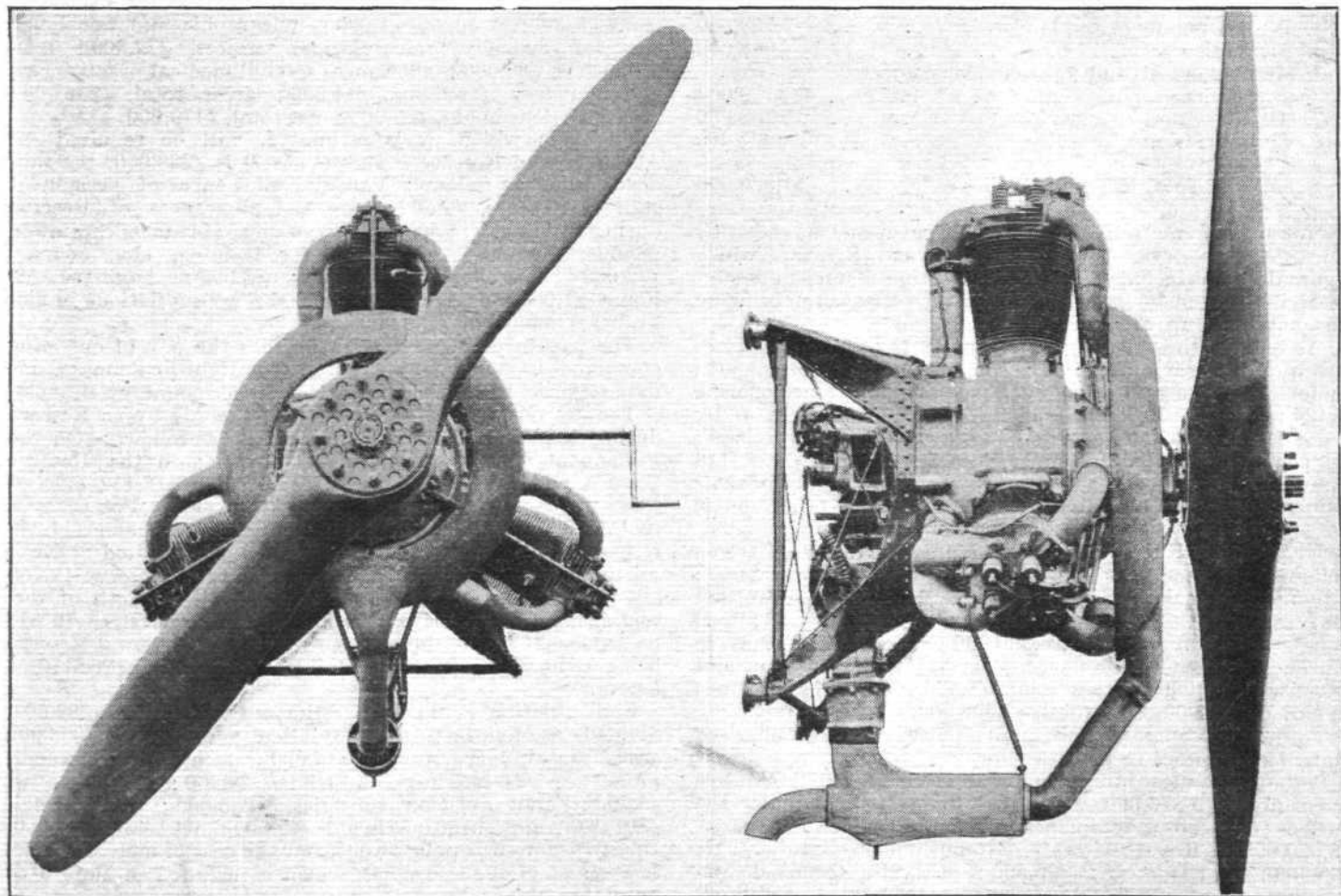
SIR CHARLES WAKEFIELD, Bt., has been elected Chairman of the Czech Society of Great Britain in place of Sir Samuel Hoare, M.P., who resigned owing to his appointment as Secretary for Air.

#### The Aero Philatelic Club

So keen is the interest in collecting Air Mail stamps and covers amongst a large section of philatelists it is gratifying to note that this particular branch of that fascinating hobby has now a club of its own, known as the Aero Philatelic Club. This is, we believe, the first time a club has been formed which is devoted entirely to one particular section of stamp collecting. The inaugural meeting of the Aero Philatelic Club took place



on March 3 at the residence of Mr. Harold L. Hayman, 16, Upper Phillimore Gardens, W. 8, when Brig.-Genl. R. Ridgway was elected President, and Mr. Harold L. Hayman Hon. Secretary and Treasurer. The main business of the meeting was the drafting of the rules of the Club. The points of interest in these was the decision to limit members to amateur collectors (of both sexes) of the British Isles, to have an entrance fee of 10s. 6d. (not leviable on members joining previous to June 1, 1923), and an annual subscription of £1 1s., and the establishment of an Exchange Section. A number of keen collectors have already become members. The Hon. Secretary will be glad to hear of any ladies and gentlemen wishing to become members. The next meeting will be held on April 20.



**THE BRISTOL "LUCIFER" ENGINE UNIT:** Our photographs show the engine as a complete unit, including exhaust ring, exhaust pipes from silencer to ring, with expansion joints, and a tail pipe passing through the carburettor heater. The engine is now supplied with non-reversible hand-starting gear in conjunction with a half-compression device. The oil-cooling system is also supplied as standard, and if desired the pressed-steel swinging mounting shown can be supplied as a standard part of the unit.



# AIR ESTIMATES, 1923-24

## A Net Increase of £1,116,000

THE Air Estimates presented to Parliament on March 8 show a net increase over those of 1922-23 of £1,116,000. The estimated gross outlay is £18,605,000, but appropriations in aid are expected to realise £6,594,000, leaving a net total of £12,011,000. The corresponding figure for last year was £10,895,000. It is intended to increase the number of officers and men of the R.A.F. by 1,824, *i.e.*, from 31,176 last year to 33,000 this year.

We have not here the space to give the various votes and heads in great detail, and those sufficiently interested are recommended to obtain from H.M. Stationery Office a copy of the Air Estimates (price 2s. net), but the following general abstract of the Estimates may be of interest. It should be observed that all figures are net, the gross figures being in all instances higher, but reducing by appropriations in aid to the net figures given:—

Net Estimates, 1923-24	..	..	..	£ 12,011,000
Net Estimates, 1922-23	..	..	..	10,895,000
Net increase	..	..	..	£ 1,116,000

<i>Personnel</i>				
Numbers, all ranks, 1923-24	..	..	..	33,000
Numbers, all ranks, 1922-23	..	..	..	31,176
Increase	..	..	..	1,824

Effective Services are estimated to require the following amounts:—

Votes.	£
1. Pay, etc., of the R.A.F.	3,508,000
2. Quartering, stores (except technical), supplies and transport	1,351,000
3. Technical and warlike stores (including experimental and research services)	3,870,000
4. Works, buildings and lands	1,799,000
5. Air Ministry	648,000
6. Meteorological and miscellaneous effective services	179,000
7. Auxiliary and Reserve Forces	238,000
8. Civil Aviation	287,000
Total Effective Services	£11,880,000

Vote 9.—Non-effective services (half-pay, pensions and other non-effective services) are estimated at £131,000 (which figure does not include certain non-effective charges in respect of Civil Aviation, which are included under that vote), bringing the net total up to £12,011,000.

As regards the grouping of personnel, the following figures are quoted: Air officers, 21; commissioned officers, 3,091; cadets, 143; warrant officers, 258; non-commissioned officers, 4,124; airmen, 22,739; boys, 2,463; giving a total, under Vote 1, of 32,839. The remaining are made up as follows: 21 commissioned officers under Vote 3; 10 air officers, 113 commissioned officers, and 4 other ranks under Vote 5 (Air Ministry), and 6 commissioned officers and 7 other ranks, attached to Auxiliary and Reserve Forces.

Under Vote 1 the summarised figures for this year are as follows: Pay and personal allowances for officers, £1,698,000; pay and personal allowances for men, £2,664,000; separation and marriage allowances, £145,000; miscellaneous allowances, £19,000; civilians, £800,000; service gratuities to officers and men on discharge, £20,000; recruiting staff and expenses, £24,000; gross total, £5,370,000; appropriations in aid, £1,862,000; net total, £3,508,000.

Vote 2 is of comparatively small interest, and no summarised statement appears to be called for.

Perhaps the most interesting of all is Vote 3, which requires the sum of £3,870,000, accounted for as follows under the various sub-heads: Aeroplanes, seaplanes, engines and spares, £3,620,000; Royal Aircraft Establishment, Farnborough, £35,500; A.I.D., etc., £90,500; aircraft, technical and warlike stores, £69,500; armament and ammunition, £253,000; electrical stores, £143,500; miscellaneous research, £219,500; miscellaneous materials, £160,500; balloons and hangars, £9,000; mechanical and other transport, £222,500; petrol and oil, £385,500; war liabilities (rewards to inventors and miscellaneous claims), £385,000; gross total, £5,594,000; appropriations in aid, £1,724,000; net total, £3,870,000.

The estimate of £3,620,000 (for aeroplanes, seaplanes,

engines and spares) exceeds that for last year by £2,833,900, and it is of interest to note that out of this amount it is intended to spend £1,913,400 on the purchase of complete machines; £940,800 on complete engines; £395,400 on machine spares, parachutes, etc.; and £370,300 on engine spares. Thus the aircraft industry should receive orders amounting to over two millions, while the engine firms should receive over one million.

Apart from Vote 1 (pay, etc., of Air Force) and Vote 3, the largest item in this year's Estimates is that under Vote 4, works, buildings and lands, which amounts to £1,799,000. Even then it shows a decrease of £27,000 on the corresponding figure for last year. Under this vote are included works, buildings and lands both at home and in Palestine and Transjordan, Iraq, Malta and Egypt. Of the total amount the largest single item is £1,259,000 for new works, additions and alterations, amounting to £2,000 each and upwards. The Boys' Training Establishment at Halton appears to be mainly paid for out of the present year's estimate, the amount remaining to come out of the 1923-24 estimates being £10,000, which is a re-vote.

The summarised statement of the estimates under Vote 5 is as follows, the sums given being salaries and allowances of the departments mentioned: The Air Council, and Department of the Secretary, £285,783; the Department of the Chief of the Air Staff, £115,783; the Department of the Air Member for Personnel, £37,660; the Department of the Air Member for Supply and Research, £116,646; the Department of the Under Secretary of State for Air (Directorate of Civil Aviation), £20,891; the Meteorological Office, £47,118; pay of messengers, porters, etc., £23,369; contingent expenses, £1,750; gross total, £649,000; appropriations in aid, £1,000; net total, £648,000.

Vote 6 (Meteorological and Miscellaneous Effective Services) is estimated at £179,000, under the following sub-heads: Compensation for losses, etc., £34,000; losses by Exchange, etc., £1,000; medals, £1,000; telegraphic and telephonic charges, £80,000; meteorological services, £72,000; miscellaneous, £30,000; allowances to civil medical practitioners and ministers of religion, £14,000; gross total, £232,000; appropriations in aid, £53,000; net total, £179,000.

The sum which, it is estimated, will be required for Auxiliary and Reserve Forces (Vote 7) is £238,000, the sub-heads being as follows: Pay and allowances of permanent staff of Reserve, £4,500; pay and allowances of Reserve during training, £14,500; Reserve pay, £144,000; capitation payments to civil companies for training, etc., courses, £72,000; miscellaneous expenses, £3,000; Auxiliary Air Force, £1,000; gross total, £239,000; appropriations in aid, £1,000; net total, £238,000.

The pay to permanent staff includes the pay of one wing commander, one squadron leader, two flight-lieutenants, one flying officer, and one flight-lieutenant (Accountant Branch).

The establishment and strength of the Air Force Reserve during 1923-24 will, it is estimated, be as follows: On the Permanent Staff, 6 officers and 7 airmen; in the Reserve Class A and AA 433 officers, Class B and BB 152 officers, Class C 70 officers and Class D 45 officers. For Class E (N.C.O. pilots, and airmen) the figures are 50 and 11,950 respectively. Thus the total personnel is estimated at 13 of all ranks on Permanent Staff, and the total Reserve 12,700 all ranks. These figures relate to the full strength of the establishment, but it is expected that the average strength will be somewhat lower, the average strength of the total Reserve being estimated at 8,137, with 13 on the Permanent Staff as before.

Civil aviation (Vote 8) is estimated to require £287,000, divided as follows: Civil aviation aerodromes, £39,000; aerial routes, surveys, etc., £16,000; technical equipment, £7,000; works, buildings, and lands, £28,300; miscellaneous, £5,700; civil aviation subsidies, £205,000; gross total, £301,000; appropriations in aid, £14,000; net total, £287,000. In a foot-note it is pointed out that the cost of meteorological services at civil aerodromes, which is included in Vote 6, is estimated at £7,000.

The non-effective services, under Vote 9, are estimated to require £131,000, the sub-heads under which these expenses occur being: Rewards to officers, warrant officers, non-commissioned officers, and airmen; half-pay to officers; service and disability retired pay and gratuities of officers; pensions and gratuities to wounded officers; service and disability pensions and gratuities (warrant officers, non-



commissioned officers and airmen); pensions, gratuities and allowances to widows, children, etc.; civil non-effective payments; recurrent charges; civil non-effective payments, gratuities and other non-recurrent charges: injury grants; commutation of retired pay, wounds, pensions, etc.

#### Memorandum by Sir Samuel Hoare

In an explanatory memorandum on the Air Estimates (Command 1826) the Secretary of State for Air says:—

The gross total of Air Estimates now presented is £18,605,000 and the net total is £12,011,000. Only £637,000 of this large difference between the gross and net figures is due to normal appropriations in aid; the remainder amounting to £5,957,000 represents the gross expenditure on Air Votes in respect of Middle East services. This latter figure is explained in detail later.

With the assent of the Public Accounts Committee a re-arrangement of some of the Votes has taken place, to conform to the re-arrangement of responsibilities in the Air Council which was carried out by my predecessor in the course of last year.

The most important change is the bringing together under Vote 3 of service and experimental technical production, for both of which the Air Member for Supply and Research is now responsible. A minor change is the transfer to Vote 6, the miscellaneous Vote, of the meteorological services outside London, thus leaving Vote 8 for civil aviation services proper. A separate Vote is set up for Air Force Reserves, which are now assuming considerable importance. Vote 9 becomes the non-effective vote. The reorganisation of the Air Council is also reflected in a re-arrangement of the sub-heads of Vote 5, the Air Ministry Vote.

An analysis of the net total of Air Estimates shows that it includes £11,486,000 for normal services and £525,000 for war liabilities. The comparable figures in 1922-23 were £9,935,500 for normal services and £959,500 for war liabilities. The true increase on services other than in the Middle East is therefore £1,550,500.

This increase is due to the scheme of expansion for Home Defence, which has already been reported to Parliament; and also to additions to the strength of the Air Force units allocated for co-operation with the Navy in consequence of the impending completion of new aircraft carriers. These two causes together would in fact have resulted in a considerably greater increase, had they not been offset by substantial economies on pre-existing services.

The scheme of expansion for Home Defence involves the formation of 15 new squadrons. This number will not be reached until April, 1925, and only seven will be formed either completely or in part during the financial year 1923-24. A proportion, however, of the initial expenditure on equipment and accommodation for the other eight squadrons will be incurred in the coming financial year, the annual liability for capital and maintenance being thus kept at an approximately even level. The additions to the strength of the air units working with the Navy amount to about three squadrons, and will take full effect in 1923-24.

Notwithstanding the strengthening of the Air Force referred to, the cost of the personnel at home is not increased. This is due to a variety of causes, among which the most important are (a) that the new service units now forming will also be used for flying training; (b) that the terms of service of various officers and airmen are being extended, thus reducing the cost of training new entrants; and (c) that additional personnel has been made available by a closer adjustment to requirements of the numbers in each trade.

The total required for works and buildings has also been kept below that for the present year, notwithstanding that considerable provision has to be made for the accommodation of new units. The Boys' Training Establishment at Halton, which is the largest building item hitherto undertaken for the Air Force, is approaching completion.

The increase on the total net Estimates is almost wholly accounted for by the increase on Vote 3, the vote for technical equipment. The war stocks upon which the Air Force has been living to a large extent since the Armistice are now becoming exhausted, and an increase in the cost of maintaining existing squadrons is therefore inevitable. The greater part of the increased provision is, however, required for equipment for the new squadrons. The demand coincides with the maturing of a number of new types, which have passed through the various stages of design and experiment in the last few years, and are shortly about to be put into production. As previously explained, Vote 3 now covers the provision of technical equipment for research and experiment as well as for the equipment of service units, and it is intended that the line between service and experimental types shall not be drawn so definitely as in the past, and that in future the first

stages of service use shall coincide in many cases with the final stages of trial. This policy should result in the earlier standardisation of types.

It will be clear from the foregoing that the orders which the Air Ministry will place with the aircraft industry during the forthcoming year will be substantially greater than in recent years. The industry has been passing through very lean times, and the paramount claims of national economy have made it very difficult for the Air Ministry to give it the assistance which its value to the State might have seemed to justify.

There is every reason to anticipate that from now on the orders placed by the Air Ministry in ordinary course and on a strict estimate of requirements will be sufficient to maintain an adequate number of firms on a sound and stable basis.

Design and research are being continued in the development of existing, and the evolution of new, types, both civil and service. The money provision for this purpose (see Appendix 2, page 71, of the Air Estimates) is approximately the same as last year. Particular attention is being directed to the improvement of the machinery for co-ordinating and utilising the activities of the various institutions engaged in pure research on aeronautics.

Provisions under Vote 8 for civil aviation is made on the same basis as last year—i.e., for the continuation of existing cross-channel subsidies, and for existing commitments in ground organisation, etc. The nature and extent of the assistance to be rendered by the State in future to civil aviation is engaging my close attention, and the fact that these Estimates merely embody the *status quo* in this respect must not be taken as necessarily implying that this represents the permanent policy of the Government. Such developments as are under consideration will not, so far as can be foreseen, involve, if approved, substantial expenditure before the financial year 1924-25.

It may be added that the arrangements contemplated for the formation of a Reserve of officers and for their training should be of indirect benefit to the civil industry.

The efforts which have been made in previous years to reduce the staff of the Air Ministry have been continued, and a reduction of over £30,000 in the Headquarters Vote has been effected. The remnants of war work have, however, nearly disappeared, and economies due to improvement in organisation and efficiency tend to be offset by the greater demands which are being made on the Department in various directions. Large or rapid reductions in this Vote are consequently not now to be expected.

As stated in the first paragraph of this memorandum, the gross total of Air Estimates includes a figure of £5,957,000 for expenditure in respect of Middle East Services. This does not affect the net total, since under existing arrangements the total cost of Middle East Services is voted in the Civil Service Estimates, and the debits against Air Votes are balanced by equivalent appropriations in aid. Excluding a provision of £916,000 for supplies to British and Indian ground troops, etc., the remaining £5,041,000 represents Air expenditure proper, and also the cost of works and ancillary services on behalf of both the Air Force and the ground troops. These latter charges are not specifically apportioned between the different arms, since all are ultimately met by the Colonial Office.

Of the sum of £5,041,000, £772,000 is provided for Palestine and Transjordan and £4,269,000 for Iraq. The provision under Air Votes for 1922-23 was £765,000 and £2,968,000 respectively. The Iraq figures for the two years are, however, not comparable, since certain services taken over from the Army have only been charged against Air Votes from October 1, 1922.

The strength of the Air Force in the Middle East for which provision is made in the two years is approximately the same; the reduction which it had been hoped to effect by this time in the ground forces has not yet matured. Owing to the delay which has occurred in the settlement with Turkey the provision for the current year has proved insufficient. It is still not possible to reduce the provision for next year to the extent which was intended; a satisfactory settlement would lead to a progressive reduction. While the pay and allowances of British and Indian ground troops do not affect Air Votes, the corresponding ancillary services, etc., as explained above, swell the gross figures.

The uncertainty of the political and military situation in the Middle East has made the work of estimating this year one of extreme difficulty. The provision proposed is not based on any optimistic hypothesis. Every endeavour will however, be made to reduce the cost of defence services in Iraq to an absolute minimum irrespective of the provision made in Estimates.



# GLIDING, SOARING AND AIR-SAILING

Those wishing to get in touch with others interested in matters relating to gliding and the construction of gliders are invited to write to the Editor of FLIGHT, who will be pleased to publish such communications on this page, in order to bring together those who would like to co-operate, either in forming gliding clubs or in private collaboration.

WE regret that it has not yet been possible to come to a final decision concerning the award of our glider design prize. The work of going through the detail stress calculations, aerodynamic estimates, etc., has taken longer than expected, and we must ask the indulgence of readers and competitors for yet another week. In our next issue, however, we hope to make the announcement and, if possible, commence publication of the winning design.

NORWAY has now definitely joined the ranks of gliding enthusiasts, the first flight being made last Thursday from the neighbourhood of the Naval base at Horten. Several flights were made, during one of which the machine rose about 150 ft. above its starting point, and covered a distance of approximately one mile. With its mountainous country Norway should be very favourably placed for gliding experiments, although in most instances it would probably be desirable to provide the gliders with means for keeping afloat, as many of the Norwegian hills and mountains face the sea or fiords, and the "landing" may in most cases have to be made on the water. However, Raynham found that one or two extra coats of Cellon dope resulted in making his machine waterproof and enabling it to float, so that there should be little difficulty in this respect. We hope to be able to keep our readers informed of further progress with Norwegian gliding and soaring.

FROM Holland it is reported that a "moto-aviette" has been constructed by Mr. Carley, of the Dutch Vickers firm, and that the new machine is to be fitted with a 9 h.p. engine, probably an adapted motor-cycle engine. The weight of the machine is given as 200 lbs. empty. Probably this figure, includes engine and propeller.

THE aviette without motor is stated to have been brought a step nearer reality by the construction by an Italian, Sig. Fantauzzo, of a small biplane fitted with two pedal-driven airscrews. This machine is alleged to have flown a distance of 100 m. (328 ft.), propelled by the pilot. The controls are operated by handle-bars. It seems improbable that the flight could have been made over flat ground, and probably the explanation is that the machine glided down a slope, the pilot's efforts helping to but a small extent, if at all, in keeping the machine aloft.

GEORGES BARBOT is to make an attempt at long-distance flying near Toulouse, where there is, it is said, a range of mountains suitable for the purpose. His starting point will probably be the "Montagne Noire" (Black Mountain).

IN Germany the regulations for this year's competitions have now been published, the February issue of *Flugsport* being devoted almost exclusively to the forthcoming German competitions.

THE Rhön Competition ("Rhön-Segelflug-Wettbewerb, 1923," will take place from August 3 to August 14. This applies to the main competition. Running concurrently with this will be held a secondary competition for less experienced pilots, and this will last until August 31, while opening on the same day as the main competition.

IN the main, the competition of this year follows the lines of those of previous years. The machines, before being admitted, must, in the case of the main competition, make a glide of at least 0.6 km. (0.37 mile), or of a duration of at least 60 secs. For the secondary competition, the corresponding figures are 0.15 km. distance or 15 secs. duration for machines controlled by shifting the weight of the pilot, and 0.3 km. or 30 secs. for machines controlled by flaps, elevators, and rudders. In addition, competitors must satisfy structural experts appointed by the organisers as to the strength of their machines.

THE preliminary competition is for pilots who do not hold a pilot's licence for power-driven machines, but who do hold the licence A issued by the German Model and Glider Society (Deutschen Modell- und Segelflugverband). For the main competition, pilots who have no certificate for power-

driven aeroplanes may be admitted by a test of 60 secs.' duration, during which two quarter-turns must be made, one left-hand and one right-hand. Holders of the class B certificate of the above-mentioned Society are also admitted.

It is of interest to note that the Rhön competition will be open to other than Germans, although such admittance is confined to subjects of countries in which Germans are not debarred from taking part in competitions.

THE Great Rhön Soaring Prize (Grosser Rhönsegelpreis, 1923) in the main competition will be awarded to the pilot who covers, in a single flight, the greatest distance in a straight line, with a minimum of 12 km. (7.44 miles). This prize is to the amount of one million marks. The first pilot to fulfil the minimum condition (12 km.) will receive 10 per cent. of the prize, and each succeeding competitor who exceeds the previous distance by 5 km. will receive 5 per cent of the prize, these amounts to be deducted from the main prize secured by the ultimate winner.

FIRST, second and third prizes, amounting to 300,000, 200,000 and 100,000 marks respectively, will be awarded for heights attained above the summit of the Wasserkuppe. The minimum height to be attained is 350 metres (1,150 ft.).

A THIRD section is for distance covered in a straight line, open to all machines, with the exception that the machine and flight which win the great Rhön Prize do not count for this one. The flight will include taking into account loss or gain in height, as well as the actual distance covered, the following formula being employed:—

$$E = E_0 - 8h_e + 12h_g$$

in which E is the distance figure on which the award of prizes will be based,  $E_0$  is the actual measured distance covered (in metres, presumably), and  $h_e$  and  $h_g$  are the figures representing loss and gain in height respectively (presumably in metres). The formula appears to work in the following manner. If a glide of 10 km. were made, and no account taken of loss of height, 10,000 would represent the figure on which the award was based. If, however, the machine dropped 1,000 metres during the flight (it does not appear that these figures refer only to the height of the alighting point, but to heights and "depths" reached during the flight) and at no time got up higher than its starting point the figure would be 10,000—8,000=2,000. If, during the flight, the machine reached a height of 500 metres above its starting point, the other figures remaining as before, the value of E would be 10,000—8,000+6,000=8,000. Presumably, the highest and lowest points reached count, so that if a machine does not drop below the point at which it ultimately alights, the height of that point will be the figure taken. Barographs are to be carried, and the gains or losses in height will be taken from their readings. The prizes in this section are 300,000, 200,000 and 100,000 marks respectively.

IN the preliminary, or secondary, competition there are four groups of prizes, each of 120,000, 100,000, 80,000 and 60,000 marks for first, second, third and fourth prize. The competitions are divided into two sections, according to whether or not the pilots are holders of a licence for motor-driven aircraft. The awards are the same in both classes, and the main divisions are for total flight duration and for duration in a single flight.

HERR F. J. M. HANSEN, of Cologne, the designer of the Statax engine, has offered a prize of 100,000 marks for the first man to make a triangular flight of 45 km. side in a glider fitted with auxiliary engine. As a glider is considered any aeroplane which has remained up for a minimum of 10 minutes without motor power. The machine may have had an engine on board, but this must have been stopped previous to the timing of the 10 minutes' glide. The engine used may be any petrol motor, not exceeding a capacity of 600 c.c. Two assistants will be allowed for starting, so that presumably there is no objection to the machine being started off from the top of a hill by rubber cords. Once in the air, however, it will have to proceed on its 84 miles flight without any other assistance than that which may be afforded by rising currents, gusts, etc. It seems likely that several of the machines competing for this prize will be fitted with the Statax motor described in our issue of November 23, 1922, which is within the cylinder capacity stipulated and is very light, weighing but 18 lbs., and developing 7.5 h.p.



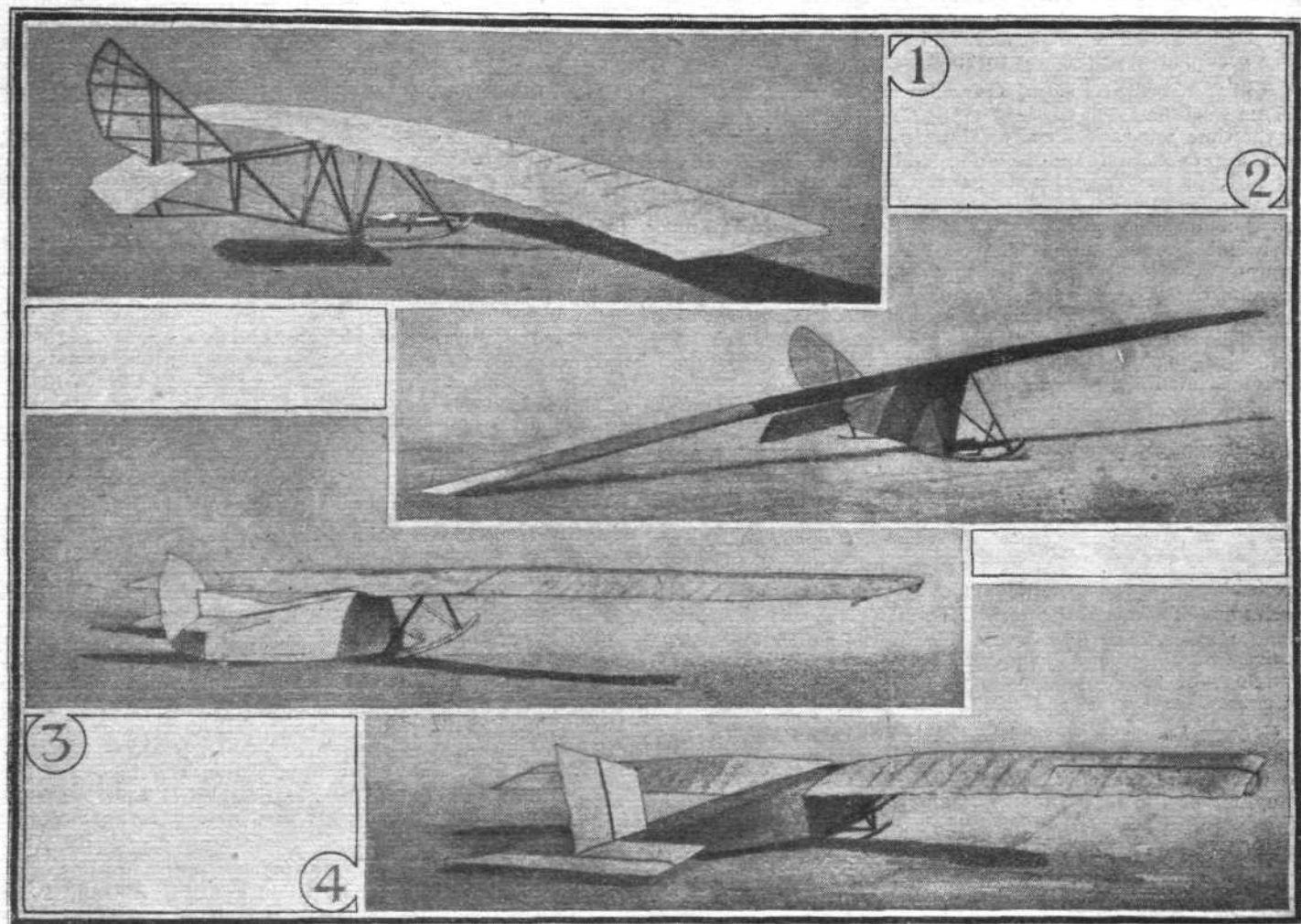
## SOME CZECHO-SLOVAK GLIDERS

REFERENCE has been made in *FLIGHT* on several occasions to the way in which Czecho-Slovakia is taking a keen interest in aviation, realising that geographically Prague is destined some day to become a great aviation centre. Lately this interest has been extended to gliding and the construction of gliders, and we are able to publish photographs this week of three new gliders designed and built in Czecho-Slovakia.

The firm "Aero," of Prague, of which the chief designer is Mr. A. Husnik, has produced a cantilever monoplane of somewhat unusual design. This machine is shown in two of the accompanying photographs, which we reproduce by courtesy of our Czecho-Slovak contemporary *Letectvi*. In one form the machine has the rear portion of the fuselage covered in, while in the other, intended for school work and

type, but on the left is a lever by means of which the angle of incidence of the wing can be altered during flight. When the machine is used for school work this lever can be locked, so that the pupil uses the machine as an ordinary fixed-wing monoplane. The span of the "Aero" glider is 14 m. (46 ft.) and the wing area 16 sq. m. (172 sq. ft.).

The "Praha" glider was designed and built by Group II of the "Aero" works, and is somewhat similar to the "Aero," although its fuselage is of rectangular section. The machine was built in such a way as to facilitate repairs, and is stated to have fulfilled this requirement admirably. As in the "Aero," the "Praha" has a central skid projecting out in front, and the pilot's seat is placed above this. The wing is supported by a single strut on each side, sloping up to the single wing



THREE CZECHO-SLOVAK GLIDERS : The two upper pictures show the "Aero," while 3 is the "Praha" and 4 the "Mura."

case of repair, the girder is left uncovered. In the latter type, diagonal wing struts can be added so as to give extra strength for school work.

The cantilever monoplane wing has a single spar, with spruce flanges and three-ply side webs. It is built in three sections to facilitate transport. The centre-section is held down by four bolts, so arranged as to allow of a slight shifting of the wing in a fore-and-aft direction for trimming purposes. The leading edge over the centre-section is covered with three-ply to give extra stiffness, the rest of the wing being fabric covered.

The fuselage is very deep in front, and is of triangular section, the materials used being steel tube in front and wood longerons and struts in the rear portion. The pilot sits in front, beneath the wing, and the lower longeron is extended forward to form a central skid. The controls are of usual

spar from the central skid. The wing ribs are flexible, and the wing can be warped for lateral control, as well as having its angle of incidence changed in conjunction with the elevator for longitudinal control. The span is 14 m. (49 ft. 2 ins.) and the chord is 1 m. in the centre, tapering considerably towards the tips. The overall length is 4.5 m. (14 ft. 9 ins.), which seems rather short for the span. It is stated, however, that the machine has proved to be very stable.

The "Mura" was designed and built by Group I of the "Aero" works, and is a monoplane of more orthodox type, with rigid wing and aileron controls. It has a two-skid undercarriage, incorporating rubber shock-absorbers, and later it is intended to fit a small auxiliary motor. The span is 12 m. (39 ft. 5 ins.) and the wing area 15.2 sq. m. (164 sq. ft.). The weight is stated to be 61 kgs. (134 lbs.). The wing, it will be seen, is slightly swept back.

### 28th Squadron Old Boys' Association

THE 28th Squadron, R.A.F., Old Boys' Association are holding, on Saturday, March 31, a Social Evening (Whist Drive and Dance) at Shearns' Restaurant, 231, Tottenham

Court Road, W., assembling at 6 o'clock. Tickets (including refreshments), 3s. single, 5s. 6d. double, are now available from the Hon. Secretary, Mr. C. T. Hodges, 102, Camden Street, N.W. 1.

# LONDON TERMINAL AERODROME

Monday evening, March 12, 1923

DURING the latter part of the week continual heavy mists and fog interfered again somewhat with the regularity of the various services. In fact, on Friday the only service to be run was the Manchester-London-Amsterdam. On this route the Daimler Airway managed to complete their scheduled services in all directions, in spite of the unfavourable weather, while from Amsterdam to London the K.L.M. also managed to get a machine through, although they had no service from London to Amsterdam.

On Saturday another football team, this time from the Royal Naval College at Greenwich, flew to Cologne to play against the Army of Occupation. They created a new record in football hustle by leaving Croydon in three of the Instone "D.H.34's" about noon on Saturday and playing their match the same afternoon. They reached Croydon on their return journey by 2 p.m. on Sunday, being absent from London only 26 hours. The single journey by train and boat would have occupied anything up to 20 hours.

## Night-Flying Over for a Time

THIS week has seen the last of the night-flying, at any rate for the time being. Several local flights have been made, and each night Messrs. Biddlecombe and Broad have waited patiently in the Trust House for the weather to clear.

Numerous telephone messages passed between Lympne and Croydon on one particular night, Lympne being quite impatient because no start was made. The weather at Lympne was ideal—clear sky and brilliant stars—while at Croydon the sky was overcast and the clouds were resting on the hills in the neighbourhood of Biggin Hill; hence the impatience of Lympne, who wished to get it over and so to bed. Judging by the general comments, everybody is glad the experiment is over for the time. They can now rely on being able to go to bed at a reasonable hour.

For the first time in the history of British aviation a broadcast wireless concert was heard by passengers in an aeroplane on Thursday. A special receiving-set was carried in the cabin of one of the Instone "D.H.34's," and seven passengers went up for a flight round the aerodrome while the afternoon concert in connection with the Ideal Home Exhibition was being broadcasted. The only attempt at an aerial was a coil of wire thrown up on to the luggage-rack, and there was, of course, no earth connection. Three pairs of telephones were used, and the concert was heard quite clearly, although there was some interference from the magnetos on the engine.

## Movements on the 'Drome

THE Surrey Flying Services have now secured the big building next to the Trust House for erecting their various machines, and are busily transferring their stock and workshops there from the garage, which they have, previously, almost filled. I understand that the garage has been taken over from Messrs. Basil Foster by Messrs. Tilling, who now do a large proportion of the passenger transport between the aerodrome and London.

The Daimler Airway have had a series of about thirty photographs taken illustrating their methods in the maintenance and overhaul at the aerodrome, and are to have these made up as lantern slides for the purpose of giving lectures on airway working. An advance viewing of these showed them to be remarkably good, and a fine record of the methods by which Colonel Searle's organisation has revolutionised air transport.

I understand that the aerodrome improvements scheme includes the diversion of Plough Lane into a new road which it is proposed to make, running across the old Beddington aerodrome and cutting the east to west leg of the "L" shape of this aerodrome about halfway.

# Personals

## Married

ERNEST TRAFFORD OWLES (late R.F.C.), son of Harry George Owles, of Hutton, Essex, was married on January 9, at Ruiru Church, Kenya Colony, to ISABELLA SOPHIE FERRIER, daughter of the Rev. Alexander Ferrier, of St. Andrews, Fife.

GEORGE LEONARD ROBINSON, D.S.O., Chaplain R.A.F., was married on February 17 at Herne Hill Wesleyan Church to CAROLYN, widow of COLIN S. THRELFALL, and youngest daughter of the late Thomas Tunnickliff, of Manchester.

## To be Married

The marriage arranged between Captain EDWARD G. H. CLARKE, M.C., the East Surrey Regt. (late R.A.F.), and Miss CAMELIA MARTIN WILDER will take place quietly at Brompton Oratory this morning, March 15.

The engagement is announced between Major EWART DOUGLAS HORSFALL, M.C., late R.A.F., only surviving son of Howard Douglas Horsfall, of Mere Bank, Liverpool, and Miss MARY DOWNING FULLERTON, of Court House, Kington, Warwickshire, younger daughter of the late Frederick

Downing Fullerton, of Ballintoy, Co. Antrim, and the late Mrs. Frederick Downing Fullerton, of Purley Park, Reading.

The engagement is announced between Flight-Lieut. HENRY GEORGE WATTS LOCK, D.F.C., R.A.F., third son of Mr. C. V. Lock and Mrs. Lock, of Sturminster-Marshall, Dorset, and PHYLLIS, only daughter of Mr. P. G. FORD and Mrs. FORD, of Burwood, Clatford, Andover.

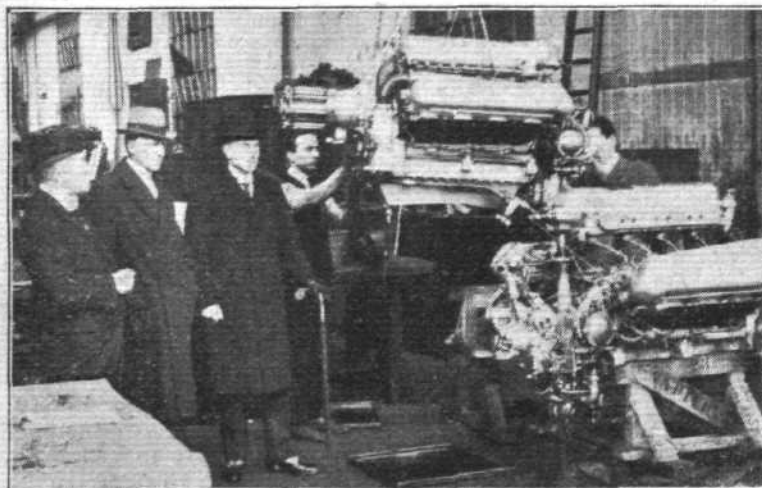
The engagement is announced of Mr. FRANCIS CALDWELL MARSH, R.A.F., son of the Rev. Canon Marsh, of St. Ives, Cornwall, and of the late Mrs. Marsh, and MURIEL ELIZABETH CURTIS, only daughter of Mr. and Mrs. WALTER SNOOK, of San Francisco, California.

## Items

MAJOR NOBILE CARLO M. GRAZIANI, Air Attaché to the Italian Embassy, has returned to London from The Hague, where he was one of the delegates to the International Air Conference.

The marriage arranged between MAJOR HAZELL, D.S.O., M.C., D.F.C., R.A.F., and Miss RIDDICK will not take place.

Lieut.-Aviateur WILLY COPPENS, Air Attaché to the Belgian Embassy, has returned to London from Brussels.



The Air Minister visits Napier Aero engine works: On March 2 the Secretary of State for Air, Sir Samuel Hoare, visited the Napier works in company with Viscount Curzon, Sir H. Brittain and others, being received by Mr. H. T. Vane. They had an opportunity of inspecting the famous Napier "Lion," and also the 1,000 h.p. "Cub," in course of construction. Sir Samuel Hoare was very interested in all he saw, and particularly in the new developments which Napiers now have in hand. Our photograph shows Sir Samuel Hoare, with Sir Harry Brittain and Mr. Vane, inspecting a "Lion" built to the order of the Japanese Government.



# THE ROYAL AIR FORCE

London Gazette, March 6, 1923

Group Capt. C. S. Burnett, C.B.E., D.S.O., is apptd. Deputy Director of Operations and Intelligence, Air Ministry, vice Group Capt. J. A. Chamier, C.M.G., D.S.O., O.B.E.; Feb. 23.

## General Duties Branch

Flying Offr. G. A. H. Pidcock is granted perm. commn. in rank stated; Oct. 24, 1919 (since promoted). *Gazette*, Oct. 24, 1919, appointing him to a short service commn. is cancelled. Wing Commr. H. A. Williamson, C.M.G., A.F.C., is restored to full pay from half-pay, Feb. 19. Flying Offr. S. J.

Sibley resigns his short service commn. and is granted permission to retain rank of Capt.; March 7.

## Medical Branch

The follg. are granted perm. commns. in ranks stated with effect from dates indicated. *Gazettes* of dates indicated in brackets, appointing them to short service commns., are cancelled. Flight-Lieut. (since promoted) A. J. Brown, D.S.O.; June 1, 1922 (June 20, 1922). Flying Offr. W. E. Barnes; May 8, 1922 (May 23, 1922).

E. G. S. Hall, M.B., is granted a short service commn. as Flight-Lieut., with effect from and with seny. of Feb. 15.

## ROYAL AIR FORCE INTELLIGENCE

**Appointments.**—The following appointments in the R.A.F. are notified:—  
**Air Commodores:** T. I. Webb-Bowen, C.B., C.M.G., from Headquarters, R.A.F., India, to R.A.F. Depot (Inland Area) (Supernumery). 27.1.23. F. C. Halahan, C.M.G., D.S.O., M.V.O., from Air Ministry (A.M.S.R.) (D.A.I.), to R.A.F. Depot (Inland Area) (Supernumery). 5.3.23.

**Group Captains:** C. S. Burnett, C.B.E., D.S.O., from R.A.F. Depot (Inland Area), to Air Ministry (Dept. of C.A.S.) (D.O.I.). On appointment as Deputy Director. 23.2.23. A. M. Longmore, D.S.O., from R.A.F. Depot (Inland Area), to Headquarters, Iraq Command. 23.2.23. J. A. Chamier, C.M.G., D.S.O., O.B.E., from Air Ministry (Dept. of C.A.S.) (D.O.I.), to Headquarters, R.A.F., India. 23.2.23.

**Wing Commander** H. A. Williamson, C.M.G., A.F.C., from R.A.F. Depot (Inland Area), to Headquarters, Iraq Command. 23.2.23.

**Squadron Leaders:** G. H. P. Padley, from No. 2 Flying Training School (Inland Area), to Aircraft Depot (India). 23.2.23. G. A. Hilliar, from Headquarters, R.A.F., Cranwell, to Aircraft Depot (India). 23.2.23. E. W. Havers, from No. 3 Stores Depot to Command Stores Depot (Iraq Command). 23.2.23. Sir N. R. A. D. Leslie, Bt., C.B.E., from No. 25 Squadron (Constantinople Wing), to R.A.F. Depot (Inland Area) (Supernumery). Pending commencement of R.A.F. Staff course, 19.2.23. R. Graham, D.S.O., D.S.C., D.F.C., from No. 60 Squadron (India), to R.A.F. Depot (Inland Area) (Supernumery). 5.2.23.

**Flight Lieutenants:** H. H. M. Fraser, from No. 2 Flying Training School (Inland Area), to Aircraft Depot (India). 23.2.23. D. W. King, from School of Technical Training (Men) (Inland Area), to Mechanical Transport Workshops and Pool (Palestine Command). 23.2.23. C. T. Anderson,

D.F.C., from School of Army Co-operation (Inland Area), to No. 3 Wing Headquarters (India). 23.2.23. C. J. Truran, A.F.C., from No. 7 Group Headquarters (Inland Area), to No. 55 Squadron (Iraq Command). 23.2.23. M. L. Taylor, A.F.C., from School of Photography (Inland Area), to Headquarters, Iraq Command. 23.2.23. G. H. Cock, M.C., from No. 2 Flying Training School (Inland Area), to No. 84 Squadron (Iraq Command). 23.2.23. T. H. Newton, D.S.C., from R.A.F. Base, Calshot (Coastal Area), to No. 45 Squadron (Iraq Command). 23.2.23. H. E. P. Wigglesworth, D.S.C., from No. 2 Squadron (Inland Area) to No. 84 Squadron (Iraq Command). For duty as Adjutant. 23.2.23. T. F. N. Gerrard, D.S.C., from No. 5 Flying Training School (Inland Area) to No. 1 Squadron (Iraq Command). 23.2.23. C. B. Dick-Cleland, from R.A.F. Staff College (Inland Area) to No. 30 Squadron (Iraq Command). For duty as Adjutant. 23.2.23. L. G. Paget, A.F.C., from No. 1 Flying Training School (Inland Area) to No. 55 Squadron (Iraq Command). 23.2.23. P. R. T. J. M. I. C. Chamberlayne, A.F.C., from No. 60 Squadron (India) to No. 20 Squadron (India). 15.2.23. C. J. S. Learlove, from No. 5 Squadron (India) to No. 60 Squadron (India). 15.2.23. K. A. Lister-Kaye, from No. 5 Squadron (India) to No. 27 Squadron (India). 15.2.23. J. V. Mason, from R.A.F. Depot (Inland Area) to Aircraft Depot (Iraq Command). 23.2.23. L. J. MacLean M.C., from Headquarters, Iraq Command, to R.A.F. Depot (Inland Area) (Supernumery). 24.1.23. W. C. Day, M.C., from No. 4 Flying Training School (Middle East) to No. 216 Squadron (Middle East). 16.2.23. J. S. Griffiths, from School of Technical Training (Men) (Inland Area) to No. 1 Flying Training School (Inland Area). 26.2.23. J. A. Perdrau, M.D., from R.A.F. Depot (Inland Area) to No. 39 Squadron (Inland Area). 28.2.23.

## IN PARLIAMENT

### Commercial Airship Service

MR. MOREING on March 7 asked the First Lord of the Admiralty whether the Admiralty propose to devote any and, if so, what sums towards the maintenance of airships?

MR. AMERY: The recommendations of the Admiralty with regard to the desirability of contributing to the maintenance of a commercial airship service are now under consideration by the Government.

### Air Service Administration

CAPTAIN W. BENN asked the Prime Minister whether he will undertake that no disintegration of the Air Service shall be sanctioned until the House of Commons has approved of the same by a direct vote?

MR. BONAR LAW: I would refer the hon. and gallant member to the answer which I gave to him on Monday last in reply to a supplementary question on this subject.

CAPTAIN BENN: Does not the Prime Minister realise the importance of making no vital change, such as this is, in the administration of the Air Service, without getting the direct assent of the House of Commons?

THE PRIME MINISTER: Yes, Sir. I feel that it is a subject on which the House of Commons ought to have an opportunity of expressing its opinion; but there is just the possibility that the Committee may report when the House is not sitting, and I do not wish to be under an obligation to present it to the House of Commons.

COMMANDER BELLAIRS: Is the right hon. gentleman aware that the naval demand only affects 5 per cent. of the Air Force, and can he break down the dog-in-the-manger attitude of the Air Force?

### Royal Navy and Air Force Co-operation

CAPTAIN VISCONT CURZON on March 8 asked the Prime Minister whether he can give the names of and the terms of reference to the Committee set up to consider the relation of the Royal Air Force to the other Services; if the question of the Royal Navy will receive prior consideration; whether the relations between the Royal Navy and the Royal Air Force will be the subject of an interim Report; and if, or by what date, the Government will be able to decide upon the question?

THE PRIME MINISTER: The question has been referred to the Committee of Imperial Defence, and it is not customary to announce the precise terms of reference to that body. The general scope of the enquiry was indicated in my reply to my noble and gallant friend on March 5. As regards the latter parts of the question, the Committee will be given a free hand to conduct the enquiry in the manner best calculated to secure a satisfactory result.

VISCONT CURZON: Are we to understand from the right hon. gentleman's answer that he does not propose to set up a special committee to deal with it *ad hoc*, but a sub-committee of the Committee of Imperial Defence?

THE PRIME MINISTER: It is a committee of the Committee of Imperial Defence, to which other names will be added.

CAPTAIN W. BENN: Will the Report be published?

THE PRIME MINISTER: No, I do not think it is customary to do that.

COMMANDER BELLAIRS: Is the right hon. gentleman aware of the necessity

for an early report, having regard to the fact that the Navy at present is maintaining 1,140 men in excess of requirements to man these craft in case they are handed over to the Navy?

THE PRIME MINISTER: Yes, I am aware of the fact mentioned, but this agreement has been come to.

CAPTAIN W. BENN: Is it a fact that the Navy is holding men in reserve to man aircraft which have not been allotted to them and which it is not decided they shall have?

COMMANDER BELLAIRS asked, in view of the promise to the House on the Navy Estimates, March 16, 1922, by the Leader of the House that a committee would be appointed to examine carefully into the system of naval and air co-operation, and to advise how we can best secure an Air Force to give the Navy the aid it may require, whether he can state why the Navy was never called upon to give evidence before such a committee; and who was responsible for this failure?

THE PRIME MINISTER: As I informed my hon. and gallant friend on March 5, the Committee referred to did not report. With the approval of the late First Lord of the Admiralty and the late Secretary of State for Air, it was arranged that in the first instance the late Secretary of State for the Colonies should take the matter up informally with the First Sea Lord and the Chief of the Air Staff, with a view to arriving at an agreement agreeable to both Services. When the change of Government took place no agreement had then been arrived at.

COMMANDER BELLAIRS: Is the right hon. gentleman aware that the House remained entirely ignorant of this fact, and that we thought the enquiry was proceeding all the time upon the promise made to us in the Naval Debates?

### R.A.F. Mechanics

MR. PRIVETT asked the Secretary of State for Air whether, in connection with the appeal now being made by his Department for skilled mechanics, he will consider the transfer to the Air Force of the young 5th class engineering artificers who are now being discharged from the Royal Navy after 4½ years' educational and mechanical training in H.M.S. *Fisgard*, and thus save the Exchequer from the heavy loss in the cost of their training?

SIR S. HOARE: I would refer my hon. friend to the reply given in the House yesterday by my right hon. friend the First Lord of the Admiralty to a similar question by the hon. member for Devonport.

### Civil Air Transport Subsidies Committee

MR. A. T. DAVIES asked the Secretary of State for Air whether, in view of the importance of the findings of the Civil Air Transport Subsidies Committee the Government will publish the evidence and proceedings?

SIR S. HOARE: I regret that I do not think that, even if it were possible, it would be advisable to publish the evidence given before the Civil Air Transport Subsidies Committee. Much of this evidence was confidential, and, moreover, the record kept of the evidence is not in a form which would permit of its publication. Several of the witnesses gave their evidence on the understanding that it would be treated as confidential. Consequently, no shorthand note was taken.

### Honours

THE King held an investiture of the Most Excellent Order of the British Empire on March 1, when the following were amongst those invested by His Majesty with the Insignia of the Division of the Order into which they have been admitted:—

#### Officer

**Military Division.**—Squadron Leader Harry Smart, R.A.F.

#### Members

**Military Division.**—Flight Lieut. Ian Cullen, R.A.F.; Flight Lieut. Wesley Oakey, R.A.F.; Sergeant-Major Percy Jackson, R.A.F.

## SOCIETY OF MODEL AERONAUTICAL ENGINEERS (London Aero-Models Association)

On Friday next, March 16, 1923, the annual General Meeting will be held at Headquarters, 20, Great Windmill Street, Piccadilly, W. 1, at 7.30 p.m.

On Saturday next, March 17, at Wanstead Flats, members will meet at 2.30 p.m., when attempts will be made on the general records.

On Friday, March 23, Mr. A. F. Houlberg will give a lecture, his subject being "Power Plants for Model Aeroplanes," at Headquarters, 7.30 p.m. sharp.

On Sunday, March 25, at Parliament Hill, members' attempts will be made on the glider records, starting at 11 a.m.

Dr. A. P. Thurston, Mr. F. de P. Green, and Mr. A. F. Houlberg have kindly promised to give prizes for a freshmen's competition, confined to members who have not won a first prize in any competition held by the Society. The prizes will take the form of suitable tools, selected by the winners, to the value of £2 2s. and £1 1s.

Hon. Secretary: A. E. JONES, 48, Narcissus Road, West Hampstead, N.W. 6, to whom all communications should be sent.

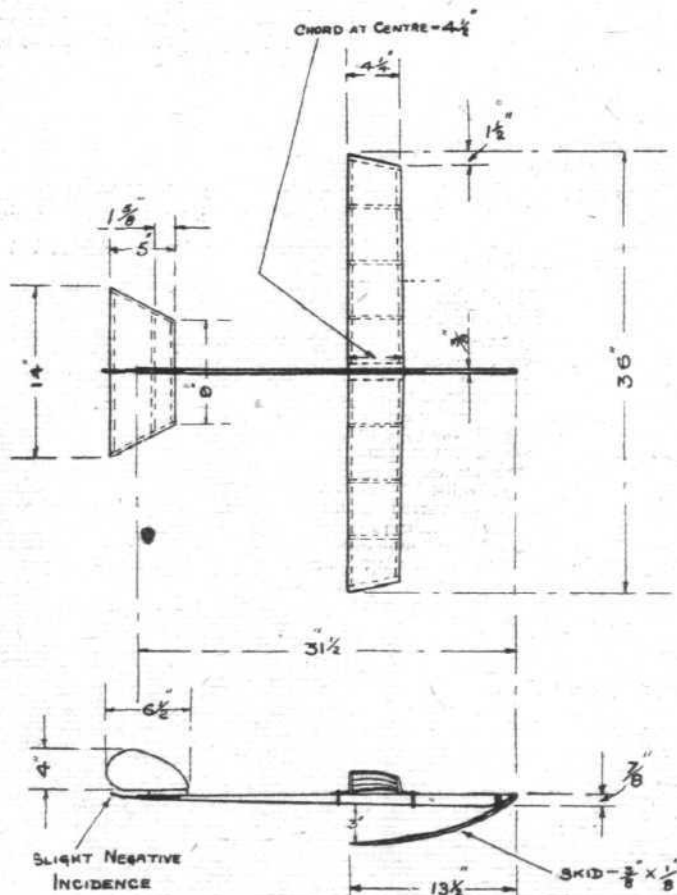
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### The F.2.B Model Glider

This week we give a few particulars and scale drawing of the F.2.B model glider. The F.2.B is a monoplane with a hollow spar fuselage, dihedral at wing tips, and a slight negative angle of incidence at the trailing edge of the tail

## GLIDER - F.2.B.

(DRAWING BY B.K. JOHNSON)



plane, as its principal features. The lead weight for longitudinal balance is sunk internally in the nose of the fuselage. The leading and trailing edges are wood, 1/4 in. by 1/8 in., and the end and central ribs, also wood, are 3/8 in. by 1/8 in. Other ribs are 1/4 in. by 1/8 in., spaced at 4 1/2 in. intervals. The wing tips are given a 2-in. dihedral. The tail plane is made up of 1/4 in. by 1/8 in. wood.

The principal characteristics of this glider are:—

Span .. .. .	36 ins.
Overall length .. .. .	31 1/2 ins.
Area of main plane .. .. .	151 sq. ins.
Area of tail plane .. .. .	57 1/2 sq. ins.
Weight .. .. .	4 1/2 ozs.
Loading per sq. ft. .. .. .	4 ozs.
Weight of load .. .. .	1 1/2 ozs.
Best duration (official) .. .. .	44 secs.

### Farmans in England

FROM the earliest days of flying there has been very close connection between the Farman brothers and this country. In fact, it might be said that it was little more than an accident which resulted in the famous brothers not establishing themselves in this country instead of across the Channel. Through the years preceding the War, Farman machines were represented here by Mr. Holt Thomas, and were for a number of years the mainstay of the Aircraft Manufacturing Co., until the services of Captain de Havilland were secured by that firm, and original designs introduced. Since the War less has been seen here of Farman products, but that amazing example of Farman design—the Goliath—has served to remind us of their existence, and we are glad to be able to announce this week that the brothers have now established a London office—at 8A, Bruton Street, London, W. 1—to deal with Farman aeroplanes, aero engines and motor-cars. The Farman aeroplanes have been described in FLIGHT from time to time, and we hope shortly to be able to give a description of the Farman 600 h.p. engine, which has passed its tests at the French *Section Technique*, and which is being further developed by flying tests in the large single-engined passenger machine exhibited at the last Paris Aero Show.

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### IMPORTS AND EXPORTS, 1922-1923\*

AEROPLANES, airships, balloons and parts thereof (not shown separately before 1910). For 1910 and 1911 figures see "FLIGHT" for January, 25, 1912; for 1912 and 1913, see "FLIGHT" for January 17, 1914; for 1914, see "FLIGHT" for January 15, 1915; for 1915, see "FLIGHT" for January 13, 1916; for 1916, see "FLIGHT" for January 11, 1917; for 1917, see "FLIGHT" for January 24, 1918; for 1918, see "FLIGHT" for January 16, 1919; for 1919, see "FLIGHT" for January 22, 1920; for 1920, see "FLIGHT" for January 13, 1921; for 1921, see "FLIGHT" for January 19, 1922; and for 1922 see "FLIGHT" for January 18, 1923.

	Imports		Exports		Re-Exports	
	1922.	1923	1922.	1923.	1922.	1923.
Jan. ..	1,152	466	76,552	60,079	23	280
Feb. ..	597	641	69,129	120,236	1100	3040
	1749	1107	145,681	180,315	1123	3320

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### AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: cyl. = cylinder; I.C. = internal combustion; m. = motor. The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

#### APPLIED FOR IN 1922

Published March 15, 1923

- 5,224. SPERRY GYROSCOPE CO. Gyro-compasses. (177,153.)  
8,518. E. H. NEWTON and J. SUTTER. Clinometers, etc. (193,305.)  
14,849. P. R. L. A. CARMIER. Sighting means for fire-arms mounted on aircraft. (180,688.)

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